

Authentication of Physical and Electronic Media Objects Using Digital Watermarks

Abstract of the Disclosure

Digital watermark methods for encoding auxiliary data into a host signal are used

- 5 to authenticate physical and electronic objects. One such method computes a content specific message dependent on the host signal, encodes the content specific message into a watermark signal, and embeds the watermark in the host signal such that the watermark signal is substantially imperceptible in the host signal. One specific implementation embeds data representing salient features of the host signal into the watermark. For
- 10 example, for photo IDs, the method embeds the spatial location of salient features of the photo into the watermark. Another implementation computes a semi-sensitive hash of the host signal, such as a low pass filtering of the signal, and embeds the hash into the watermark. The watermark signal may be content dependent by making the watermark key dependent on some attribute of the signal in which the watermark is embedded.
- 15 Another approach is to make the watermark key dependent on a user or an attribute of the user. Yet another approach is to use multiple watermark components and multiple watermark detection stages that help identify and screen out invalid watermark signals. Another digital watermarking method for authenticating a media object transforms a media signal to a frequency domain comprising an array of frequency coefficients. It
- 20 selects a first set of frequency coefficients, and alters the selected first set of frequency coefficients so that values of the coefficients in the set correspond to a pattern. The pattern of the media signal is authenticated by comparing a pattern of the values of the frequency coefficients in the set with an expected pattern.

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000